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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,732	09/17/2003	Toshihiko Murakami	501.43144X00	2637

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EXAMINER

MASDON, DAVID T

ART UNIT PAPER NUMBER

2188

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/663,732

Applicant(s)

MURAKAMI, TOSHIHIKO

Examiner

David Masdon

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/17/03</u> <u>2/27/04</u> | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statements (IDS) were submitted on 9/17/2003 and 12/07/2004. The submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### ***Drawings***

2. The drawings filed on 9-17-2003 have been approved by the examiner.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 2-10 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. "Relatively small" (claim 2, line 4) is vague and indefinite and needs to be more specific. It is unclear how the small the capacity of the memory area needs to be. Appropriate action is required.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2-10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "relatively small" in claim 2 (line 4) is a relative term which renders the claim indefinite. The term "relatively small" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The capacity of the memory area has been rendered indefinite by the use of "relatively small".

Claims 3-10 are rejected because of their dependency.

7. Claims 1-18 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1, 13, 16 the phrase "as an opportunity" is unclear and indefinite. The applicant needs to be more specific in their terminology. For reason of review, it will be assumed that the phrase has been omitted.

Claims 2-12, 14, 15, 17, 18 are rejected because of their dependency.

8. Claims 2-10, 14-15 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. In claims 2, 14 the phrase "increase as an opportunity" does not clearly describe the capacity of the memory areas. Claims 2, 14 need to be re-worded to clearly describe what the invention is.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Nahum (WO 01/80013).

With respect to claim 1, Nahum discloses a data transfer method in a computer system, comprising:

plural computers [(The SAN coupling an array of hosts) page 1, lines 12-13; Fig. 1, element 1]

plural memory devices; [(coupled to an array of storage devices) page 2, line 13; Fig. 1, element 4]

a relay device which connects the computers and the memory devices; [(via a Network switch) page 2, line 13-15; Fig. 1, element 2]

and a management device which manages the computers, the memory devices and the relay device, [(coupling a Storage Virtualization Manager) page 2, line 19; Fig. 1, element 3]

wherein the management device sets virtual memory areas of the memory devices for the plural computers and holds information on contents of the setting as first information, [(the SVM being configured for virtualization of the storage capacity) page 2, lines 21-25]

the relay device holds second information which is created based upon the first information, [(managing I/O storage) page 10, lines 15-16]

the virtual memory areas correspond to memory areas in the respective memory areas or a memory area formed by combining memory areas in the plural memory devices, [(a virtual volume is a list of physical storage areas or Stripe Areas concatenated and presented to a host computer as a single Virtual storage device) page 1, lines 12-14]

and the relay device selects one virtual memory area from the second information [(the network switch also centrally manages storage allocation) page 1, lines 32-33]

and, with the case in which the selected virtual memory area is a memory area formed by combining the memory areas in the plural memory devices as an opportunity performs data transfer among the plural memory devices. [(for routing communications between hosts 1 and array of physical storage devices) page 10, lines 15-17]

With respect to claims 3 and 15, Nahum discloses the second information is updated based upon the first information. [(the first configuration portion and the second translation portion of the virtualization computer program being coupled in interactive operative association) page 6, lines 1-4]

With respect to claim 4, Nahum discloses third information indicating whether data transfer is incomplete or data has been transferred. [(SVM 3 runs a device-polling mechanism for a continuous status-update) page 11, lines 9-10]

With respect to claims 5 and 17, Nahum discloses the second information that has a flag indicating a state of whether or not data transfer is in progress [(the configuration table, including presence and permissions, is kept updated) page 14 lines 1-2] and the relay device that judges which of a data transfer source and data transfer destination should be accessed [(The SVM 3 maps the presence, availability and permission level granted to each host computer into a detailed configuration table of allocations also including data about the storage capacity available in the physical storage devices 4) page 11, lines 11-14]

With respect to claims 6 and 18, Nahum discloses a relay device that directly copies data of a memory area to a memory area of the data transfer destination. [(from they are routed directly to their physical addresses in the disk storage) page 16, lines 44-45]

With respect to claim 7, Nahum discloses a relay device that once copies data of a memory area to a memory area in the memory device prepared in advance for data transfer and, then, indirectly copies the data to a memory area of the data transfer destination. [(The Network Switch 2 is known in the art as a Network Hub for managing I/O storage and for routing communications between hosts 1 and an array of physical storage devices 4, also called the storage subsystems 4) page 10, lines 15-17]

With respect to claim 8, Nahum discloses a relay device that once copies data of a memory area to an unused memory area of the memory areas of the plural memory devices and, then, indirectly copies the data to a memory area of the data transfer destination. [(The Storage Manager module 50 then inspects the lists of the available physical devices 4 and of the Stripe Sets, to find one list containing the free space requested. If the space is found, then the user request for storage is granted) page 16, lines 27-31]

With respect to claim 9, Nahum discloses a relay device that keeps data in the virtual memory areas before data transfer temporally or for a designated period even after the data transfer. [(Now, when the File System driver 64 issues an I/O request to a Virtual Volume, the Volume driver 61 translates the request into one or more disk requests) page 16, lines 41-43]

With respect to claim 11, Nahum discloses a management device distributes the first information to all the relay devices and uses the first information as an information source of the second information. [(The SVM 3 also receives configuration-polling requests from an SVM Driver, residing in each host 1, but not shown in Fig. 1.) page 11, lines 15-16]

With respect to 12, Nahum discloses that the second information is always synchronized among the components constituted redundantly, whereby, in the case in which one of the components constituted redundantly fails, the relay device uses the second information of the other components constituted redundantly. [(The SVM Driver



operates a configuration polling mechanism, launched every few seconds (say 5 to 10 for example), for the detection of changes occurring in the configuration of the SAN) page 11, lines 16-18]

With respect to claim 13, Nahum discloses a computer system comprising:

plural computers; [(The SAN coupling an array of hosts) page 1, lines 12-13; Fig. 1, element 1]

plural memory devices; [(coupled to an array of storage devices) page 2, line 13; Fig. 1, element 4]

a relay device which connects the computers and the memory devices with each other; [(via a Network switch) page 2, line 13-15; Fig. 1, element 2]

and a management device which manages the computers, the memory devices, and the relay device, [(coupling a Storage Virtualization Manager) page 2, line 19; Fig. 1, element 3]

wherein the management device sets virtual memory areas of the memory devices for the plural computers and holds information on contents of the setting as first information, [(the SVM being configured for virtualization of the storage capacity) page 2, lines 21-25]

the relay device holds second information which is created based upon the first information, [(managing I/O storage) page 10, lines 15-16]

the virtual memory areas correspond to memory areas in the respective memory areas or a memory area formed by combining memory areas in the plural memory devices, [(a virtual volume is a list of physical storage areas or Stripe Areas concatenated and presented to a host computer as a single Virtual storage device) page 1, lines 12-14]

Art Unit: 2188

and the relay device selects one virtual memory area from the second information and, with the case in which the selected virtual memory area is a memory area formed by combining the memory areas in the plural memory devices as an opportunity, performs data transfer among the plural memory devices. [(for routing communications between hosts 1 and array of physical storage devices) page 10, lines 15-17]

With respect to claim 16, Nahum discloses a relay device connecting computers and memory devices with each other, comprising:

an interface section for making connection with the computers or the memory devices;

[(the array of hosts being coupled to the array of storage devices via the Enhanced Network Switch)

page 7, lines 23-24; Fig. 18, element 2E]

a routing control section which performs routing of a packet received from the computers or the memory devices; [(for routing communications between hosts 1 and array of physical storage devices) page 10, lines 15-17]

and a management section which manages the entire relay device, [(coupling a Storage Virtualization Manager) page 2, line 19; Fig. 1, element 3]

wherein the management section holds second information which is created based upon information on contents of virtual memory areas of the memory device set for the computers, [(the SVM being configured for virtualization of the storage capacity) page 2, lines 21-25]

the virtual memory areas correspond to memory areas in the respective memory devices or a memory area formed by combining memory areas in the plural memory

Art Unit: 2188

devices, [(a virtual volume is a list of physical storage areas or Stripe Areas concatenated and presented to a host computer as a single Virtual storage device) page 1, lines 12-14] and the management section selects one virtual memory area from the second information and, with the case in which the selected virtual memory area is a memory area formed by combining the memory areas in the plural memory devices as an opportunity, performs control of data transfer among the plural memory devices via the routing control section and the interface section. [(the translation from virtual addresses into physical locations for data storage is) page 11, lines 1-8]

### ***Claim Rejections - 35 USC § 103***

¶, The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C 103 (a) as being unpatentable over Nahum (WO 01/80013) in view of Barnett (US 6971016). Nahum does not disclose expressly a memory area in the relay device. However, Barnett discloses a switch 130 that includes a non-volatile storage device 304 (column 5, lines 1-2).

Nahum and Barnett are analogous art because they are from the same field of endeavor namely storage networks. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the switch containing

memory of Barnett into the system of Nahum. The motivation for doing so would have been to prevent data transfer bottlenecks.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Masdon whose telephone number is (571)272-6815. The examiner can normally be reached on Monday - Friday, 7:30am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571)272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM

Mano Padmanabhan  
12/8/05

**MANO PADMANABHAN  
SUPERVISORY PATENT EXAMINER**